A Dissertation
on
Cynanche Trachealis
by
Amasa T. Park of
Columbia S. Carolina

November
1825

Passed March 24th 1826

Cynanche Trachealis or croup.

This is a disease for the most part peculiar to early life. Altho' several cases are recorded of its having attacked adults, yet this is to be considered as extremely rare. It prevails extensively in the United States, & is chiefly to be met with along the sea coast, & in wet, marshy situations. It consists in an inflammation affecting the mucus membrane, lining the internal surface of the larynx, trachea, & bronchia, & hence, should have more properly been denominated trachitis. This inflammation runs so high, as to induce the vessels of those parts to throw out coagulable lymph, instead of merely exciting them to an increased, or altered secretion.

By an accurate & experienced observer, the approach of this disease may be ascertained, several days before it actually makes its appearance. The child becomes fretful & uneasy, shews no inclination to indulge in its ordinary amusements, & is affected with some degree of cough which, at first, resembles a common catarrh, but sometimes, tho' rarely, it has the

peculiar ringing sound from the ~~first~~ beginning. The face becomes flushed, the eyes often suffused & inflamed, & there may be detected some slight febrile action, particularly in the night. The appetite is much diminished, or totally lost, & if the tongue be examined, it will be found covered with a white fur. This state of things may continue for several days, without giving the least warning of the danger that is about to follow, until suddenly, the symptoms become developed, & show themselves in their true colours. At other times, the attack comes on suddenly, without any previous indisposition whatever.

The disease manifests itself by a difficulty of breathing, attended with a distressing wheezing noise; the cough has a particular, shrill, ringing sound, which, when once heard, can never afterwards be easily mistaken. The face becomes red, the skin hot, & the child if old enough, complains of tightness about the throat. The pulse is from the first frequent, & the patient restless & ~~an~~ anxious.

The cough returns in fits, which continue to increase in violence as the case advances, but in this stage of the complaint, is commonly unattended with expectoration. During the paroxysm of coughing, the child struggles violently, the eyeballs appear as if starting from their sockets, & there is every appearance of instant suffocation. Should the patient have the good fortune to recover from this fit, the symptoms may be for a time, considerably abated; respiration becomes more free, the voice & cough more natural, & perhaps sleep may be induced. But this is a deceitful calm, & should by no means induce us to suppose that the danger is over.

After a time the disease returns with redoubled force, all the symptoms are aggravated, & if not very soon subdued, must inevitably prove fatal. The cough returns at shorter intervals, the heart & arteries are thrown into violent commotion, the respiration becomes more stridulous, & repeated at longer intervals, until finally, it is suspended altogether. Before death, the

assumes a purple or blue colour, & the lips become livid. What
In the early stages the cough is frequently attended with vomiting, & the throat is liable to become swelled.

The duration of the complaint is exceedingly various. This must of course depend on the violence of the symptoms, & the age & constitution of the patient. It sometimes terminates fatally in a very few hours but in other cases continues for as many days, & may even run on for a week.

The causes of croup, may, with propriety, be divided into the remote & immediate. By the remote causes we are to understand those, which by producing a certain state of the system, render it peculiarly susceptible to the action of the disease. Among this class regard is to be had to age, habits, sex, education, temperament &c. The disease most frequently attacks children, from the age of seven months, to four of five years. & Cullen thinks that children are more liable to it, after they are weaned, than before. It has very rarely been

known to attack adults, the reason for which, perhaps, may not be very difficult to understand, when we consider the greater activity of the mucous system in children, the facility with which diseases of that system are developed, the great susceptibility of young persons, & the small size of the glottis, larynx, & trachea, compared with those of the adult.

The sanguine temperament has been said to be a predisposing cause of croup, & in such temperaments, the disease is always decidedly inflammatory. When connected with a sanguineo-nervous temperament, it is extremely violent & rapid, terminating in the course of a few hours. Persons of a lymphatic temperament, are especially liable to diseases of the mucous membranes, & hence an inactive & sedentary life, which is favourable to the development of this system, may prove a predisposing cause of cynanche trachealis

The immediate causes may be divided into external & internal.

Among the internal causes may be reckoned catarrhal affections, & the cutaneous phlegmasiæ, such as rubeola, scarlatina, cynanche maligna &c.
Of the external causes, the most frequent is the application of cold & moisture, & hence it is most common in low, wet situations, & occurs generally in winter, or autumn, or the commencement of spring.
I believe that croup is never propagated by contagion, however, some physicians may affect to believe the contrary, but it seems frequently to depend upon an epidemic influence of the atmosphere. It is a disease to which certain families seem to be predisposed, & the same patient is subject to repeated attacks after the first paroxysm, from any slight exposure to cold.

On the diagnosis it is unnecessary to say much. A slight acquaintance with the peculiar symptoms attending the complaint, will readily enable us to distinguish it from all other diseases.
There is a spurious kind of croup, however, which sometimes

attacks children, & is often mistaken by practitioners for the genuine disease. Ferriar has laid down the following circumstances to assist us in establishing the diagnosis

1st In the spurious croup, the cough has not the shrill, whining sound which marks it in genuine cases. It is hoarser, & the intervals are longer.

2d Respiration is not so much affected in the spurious croup, even when the cough becomes alarmingly violent, & the obstruction does not produce the sibilation peculiar to croup, but resembles more a common dyspnœa.

3d The spurious croup is not attended with the trembling, restlessness, & palpitation of the arteries, which characterize the other. This species commonly cures itself, or, at most, requires no other remedies than common demulcents.

Croup may be distinguished from acute asthma, by the following diagnostics. In asthma

there is frequently little or no cough. In croup there is much febrile excitement, the urine is high coloured, & the voice shrill; whereas, in asthma, the pulse is not so full, the urine is limpid, & the voice croaking & deep.

From cynanche laryngea it may be distinguished by the absence of cough, & the period of life, at which it occurs.

Nor is it necessary to dwell long on the prognosis. If the most urgent symptoms are not relieved in six or eight hours, the termination of the case will most probably be fatal. The unfavourable symptoms are, great difficulty of respiration, frequent fits of coughing, unattended with expectoration, much anxiety, & the pulse becoming irregular & intermitting. The younger the child, the greater will be the danger.

Those cases end best where the breathing is least affected, the febrile symptoms moderate, & above all, where the cough is early attended with expectoration. P

Post mortem

examinations of children who have died of croup, exhibit the

following appearances. Unless the disease has proved rapidly fatal, the lungs are found in a state of inflammation, & sometimes adhesions to the pleura are discovered. The trachea & ramifications of the bronchia, are found filled with mucus, or coagulable lymph. This mucus is sometimes seen hard & incrusted, giving it the appearance of a membrane lining the internal surface of the larynx, or trachea, & which is often coughed up in considerable portions. By some, this has been considered as the cause of the disease, but it is evidently, merely the exudation of coagulable lymph, (the effect of inflammation), which becomes concrete, & assumes the appearance of a membrane. This appearance, I believe, has rarely been met with in this country.

It is only in cases that have continued for some time that these appearances are to be found. When death occurs suddenly, none of the marks of inflammation can be discovered in the neighbourhood, or seat of the disease, & hence it is probable, that in such cases, the disease consists in a spasmodic affection of the muscles of the glottis. But this spasmodic action cannot exist long without inducing inflammation, therefore, we

may infer, that in lingering cases, death is produced in consequence of effusions blocking up the trachea, & causing suffocation.

As cynanche trachealis is a disease so short in its duration, & of such fatal tendency, it is evident, that the treatment in the very commencement should be active & decisive. There is probably no disease prevalent in the United States, whose pathology is now better understood, or which can be more generally cured, than the disease in question, if the proper practice be instituted sufficiently early.

In the early or forming stage, our endeavours should be exerted to overcome the inflammatory or spasmodic action, which exists in the larynx, trachea, & bronchia. For this purpose venesection is the appropriate remedy, & the only one to be relied on. If the case be a severe one, the abstraction of blood should be large, & continued usque ad deliquium animi, unless the symptoms are sooner mitigated. Even if we are not called to the patient for some time after the attack, if the difficulty

of breathing be very great, & the subject plethoric, bleeding should not be neglected. Sometimes, in the cases of very young children, it is difficult to draw blood by the lancet. In such a case we must have recourse to cups & leeches applied to the throat. These last however, it may be remarked will generally be found useful, & should be employed after the general bloodletting, if the symptoms require it. I am aware that there is a strong prejudice existing in the minds of some physicians against employing venesection, & other very active remedies, in the cases of young children. But Dr. Chapman has, I think, shown that this opinion is unfounded & absurd. There is no reason to doubt that children can bear bleeding & other evacuations as well, if not better, than adults. It is certain they recover from their effects much more rapidly. At all events it is ~~conceded~~ conceded, at least in this country that this constitutes the main & essential point in the cure of cynanche trachealis.

The bleeding should

be instantly succeeded by the exhibition of an emetic. In milder cases, this alone, will oftentimes instantaneously put a stop to the disease. Tho indicated more particularly in the commencement, emetics will be found useful in the more advanced stages when the lungs become implicated in the case. These organs now become engorged & oppressed, amounting in fact to peripneumonia notha. Under these circumstances nothing will answer a better purpose, than active vomiting. Here too the warm bath is eminently serviceable.

Of the particular emetics to be employed, ipecacuanha, or a solution of tartarized antimony is preferable.

Should the disease still resist this treatment, a large blister may be applied to the throat, & kept open by some stimulating dressing.

Calomel appears to be a powerful remedy in croup & if rightly administered, is often attended with the most happy results. It was originally employed by Dr. Huhn of Philadelphia.

In order to derive the greatest advantage from its use, it should be administered in the largest possible doses, until copious stools of a dark green colour are produced. It is astonishing what immense quantities of calomel have been taken in this disease, without materially affecting the constitution. Professor Hamilton of Edinburgh, says, that he has given upwards of one hundred grains in less than twenty four hours to a child of two years old. He says also, that in every case, where he has seen it employed, previous to the occurrence of lividness of the lips, & other mortal symptoms, it has completely succeeded in curing the disease. As soon as the green coloured stools are produced, & the symptoms begin to yield, the calomel should be gradually omitted to obviate the debility which is apt to be induced from its use.

By some practitioners antispasmodics have been almost exclusively trusted to for the cure of cramp.

But from all that has been said concerning the nature of the disease, it is evident, that they are totally inadequate, & that in the early stages it would be worse than useless

to employ them. But in the advanced stages, when active inflammation has been reduced, & the disease is chiefly spasmodic, we may recur to moderate doses of the tincture of opium with considerable advantage, for the purpose of procuring rest & a remission of the spasms.

As an expectorant & emetic in the disease, the seneca has for a number of years enjoyed considerable reputation. It was first introduced by Dr. Archer of Maryland. As an emetic, it is inferior to ipecacuanha or emetic tartar, but, it may be used with advantage to assist the expectoration of the mucus.

Preparations of squill may be used for the same purpose.

Some cases of croup have been successfully managed by the tincture of digitalis. Its efficacy seems to depend on the powerful action it exerts on the arterial system, thereby subduing inflammatory action, & calming spasmodic irritation. It however should never be resorted to as a substitute for venesection.

The hives syrup of Prof. Coxe is an invaluable remedy in croup. The principal ingredients are, seneca snake root, squill & a small portion of emetic tartar, & hence it acts at once on the skin, stomach, & bowels. It should be exhibited in doses of from ten drops to a drachm or more according to the age of the child, & urgency of the symptoms.

Throughout the whole course of the disease, the bowels must be kept open by the frequent exhibition of ~~xxxx~~ purgatives, assisted if necessary by enemata, & the antiphlogistic plan rigidly observed in all its details.

By pursuing these measures, the progress of this most alarming disease, may, very generally, be cut short, & the patient saved. But, if the case should resist this treatment, or more especially, if it has been improperly treated, & still continues to advance, the operation of bronchotomy has been proposed as a last resource. Altho' not often successful, owing, perhaps, to its not being usually performed, until effusion has taken place in the lungs,

yet in these desperate cases we should not hesitate to have recourse to it. Surely every principle both of science & humanity would justify us in giving to the unhappy sufferer, this last chance for his life.